

# Frailty is a Predictor for Worse Outcomes in Patients Hospitalized with *Clostridioides difficile* infection



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## Introduction

Frailty is recognized as having major health implications for affected patients and is applicable in the peri-operative risk assessment. Hospital Frailty Risk Score (HFRS) is a validated score that solely utilizes International Classification of Diseases codes (ICD-10) in the identification of patients who are at higher risk. In this study, we investigated the utility of HFRS in identifying patients admitted with *Clostridioides difficile* infection (CDI) who are at risk for worse clinical outcomes and higher healthcare resource utilization.

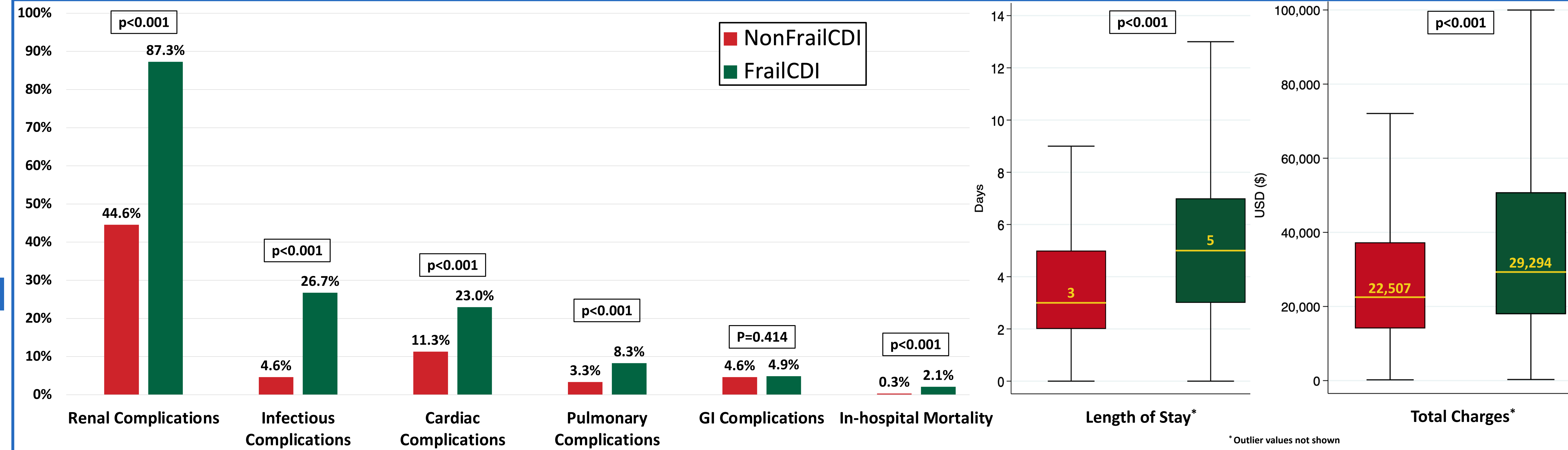
## Methods

Using the 2017 National Inpatient Sample, we identified all adult patients who were discharged with a primary diagnosis of CDI. We then classified patients into 2 groups: those who had HFRS of  $\leq 5$  (NonFrailCDI) and those with a score of  $>5$  (FrailCDI). Primary outcomes included all-cause in hospital mortality rates and healthcare utilization while secondary outcomes included hospital complications. Discharge-level weights were applied to provide national estimates.

## Results

We identified 93,810 hospitalizations with a primary discharge diagnosis of CDI, of which 54,300 (57.88%) were FrailCDI while 39,510 (42.12%) were NonFrailCDI. FrailCDI had higher rates of in-hospital complications and healthcare resource utilization when compared to NonFrailCDI.

## Results



Variable	N=93,810	
	NonFrailCDI n=39,510	FrailCDI n= 54,300
Female, %	63.95	64.31
Age (years), mean $\pm$ SD	60.07 $\pm$ 18.63*	70.53 $\pm$ 15.43*
Age $\geq$ 65 years, %	44.50*	69.48*
Charlson co-morbidity index), mean $\pm$ SD	1.56 $\pm$ 1.92*	2.77 $\pm$ 2.25*
Hospital Frailty Risk Score, mean $\pm$ SD	2.59 $\pm$ 1.51*	8.95 $\pm$ 3.27*

Table 1: Baseline Characteristics

\*  $p < 0.05$

Outcome	Adjusted Odds Ratio* (FrailCDI vs NonFrailCDI)	95% CI	p-value
In-hospital mortality	4.49	[2.84 – 7.11]	$< 0.001$
Length of Stay (Days)	1.70**	[1.55 – 1.86]	$< 0.001$
Total Charges (\$)	11,843.56**	[10,366.32 – 13,320.8]	$< 0.001$
Cardiac complications	1.13	[1.02 – 1.25]	$0.013$
Pulmonary complications	1.92	[1.65 – 2.22]	$< 0.001$
GI complications	1.17	[1.00 – 1.36]	$0.048$
ID complications	6.80	[6.01 – 7.69]	$< 0.001$
Renal complications	8.76	[8.08 – 9.48]	$< 0.001$
Required Intensive Care Unit	13.70	[6.28 – 29.90]	$< 0.001$

Table 2: Multivariate Regression for the Outcomes

\* Analysis adjusted for age, gender, race, hospital location and teaching status, insurance, median household income and Charlson co-morbidity index

\*\* Adjusted co-efficient representing the average difference in this outcome between FrailCDI and NonFrailCDI

## Conclusion

Frailty status as defined by HFRS is an independent factor for worse outcomes and higher healthcare utilization in adult patients admitted for CDI even after adjusting for age and Charlson co-morbidity index. By considering this index in patients with CDI, we might consider more aggressive therapy to improve outcomes. Further research is needed to identify which therapeutics are most optimal in the frail population.